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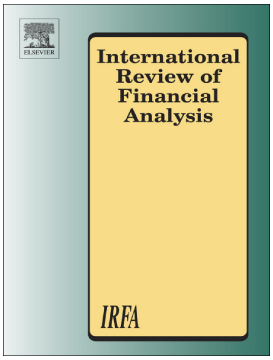
DOI:
10.1016/j.irfa.2017.12.007



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PII: S1057-5219(17)30215-6
DOI: https://doi.org/10.1016/j.irfa.2017.12.007
Reference: FINANA 1172

To appear in: *International Review of Financial Analysis*

Received date: 28 September 2016
Revised date: 20 October 2017
Accepted date: 28 December 2017

Please cite this article as: L. Lepetit, C. Meslier, F. Strobel, L. Wardhana , Bank dividends, agency costs and shareholder and creditor rights. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Finana(2017), https://doi.org/10.1016/j.irfa.2017.12.007

Bank dividends, agency costs and shareholder and creditor rights

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Abstract

Using data on listed banks in 51 countries, we analyze whether banks' dividend payouts are influenced by the relative strengths of the agency conflicts faced by their shareholders and creditors. We show that dividend policy depends on the relative strengths of these agency conflicts, but with a more decisive role played by the agency cost of equity than the one of debt, in contrast to results found in the literature on non-financial firms. We then further investigate whether those relationships are shaped by differences in funding structure, levels of capitalization and capital stringency, and potential differences in external corporate governance mechanisms.

Keywords: bank dividend; agency conflict; corporate governance; regulatory environment

JEL code: G21; G28; G32; G35

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1. Introduction

The dividend policy of banks has moved into the regulatory spotlight recently, with both the Federal Reserve Board (FRB, 2011) and the Basel Committee on Banking Supervision (BCBS, 2011) emphasizing the necessity to increase oversight of bank dividend payouts. This focus is at least in part motivated by the fact that some banks distributed large dividend payouts during the 2007-2008 financial crisis despite incurring heavy unanticipated losses (Acharya et al., 2011). This could seem surprising, as a bank distributing earnings as dividends reduces its ability to retain capital internally, and thus transfers default risk to bank creditors and the deposit insurer.

It is well known, however, that dividends play an important role in mitigating the agency conflict between managers and shareholders, as paying dividends reduces the amount of free cash flow at managers' disposal for potential extraction of private benefits (Easterbrook, 1984; Jensen, 1986; Zwiebel, 1996). Furthermore, while paying dividends may weaken the agency conflict of equity between managers and shareholders, it may actually strengthen the agency conflict between debtholders and shareholders, through wealth transfer between the two; managers might be under pressure from debtholders to reduce dividend payments as a consequence. Hence, managers face conflicting pressures that might have an impact on their dividend policies; these pressures will depend on the relative strengths of shareholders' and debtholders' influence and incentives. While there is an extensive literature analyzing whether dividend policies are used as a corporate mechanism to reduce agency conflicts in the case of non-financial firms, few empirical papers analyze it for financial firms, despite being of great importance for both policymakers and regulators. The distribution of earnings as dividends obviously reduces banks' ability to generate capital internally, and can thereby transfer default risk to their creditors, the deposit insurer and potentially, ultimately, the taxpayer. Our paper aims to contribute to an empirical evaluation of the influence of both shareholders and debtholders on bank dividend policy in this context. Banks are highly leveraged with a large proportion of their debtholders benefitting from a deposit insurance system, reducing their incentives to exert pressure on managers to cut dividend payments. If the pressure exerted by shareholders is stronger than that of debtholders, this could represent one of the explanations for why banks continue to pay dividends even during periods of economic difficulty.

The existing literature on payout policy, mostly focusing on non-financial firms, has directed most of its attention to the agency conflict between managers and shareholders (e.g. Denis et al.,

1994; Yoon & Starks, 1995; Li & Zhao 2008); only recently some papers also analyze the impact of the agency conflict between shareholders and debtholders on dividend policy. These papers generally conclude that creditors play a more decisive role than shareholders in determining the dividend policy of non-financial firms (Brockman & Unlu, 2009; Chu, 2017; Shao et al., 2013; Tsai & Wu, 2015). Among the small number of papers that have started putting emphasis on the role of debtholders in bank dividend policy,[e] Srivastav et al. (2014) examine the role of debt-based CEO compensation on U.S. banks' payout policy, showing that CEO incentives stemming from inside debt influence bank payout policy in a manner that protects debtholder interests. Onali et al. (2015) show that the presence of government officials on the board of directors of European listed banks shapes managers' incentives in favor of bank creditors and leads to lower payout ratios. However, the potential impact of the balancing strategy faced by bank managers stemming from the conflicts of interest of shareholders and debtholders has not been examined to date.

Our aim is to contribute to the literature on bank dividend policy by examining how banks' dividend policy depends on the relative strength of the various agency conflicts occurring between different stakeholders, and how it is influenced by banks' specific funding structure and the regulatory environment facing the banking industry. The incentives for both depositors and uninsured debtholders to discipline managers might be weaker than those of shareholders. Only large depositors would demand that managers pay less dividends in the presence of a deposit insurance system, while the implementation of implicit government guarantees, such as bail-out packages, may reduce uninsured creditors' incentives to monitor bank managers (Gropp et al., 2014; Karas et al., 2013). Moreover, debtholders might be more confident to recover their claims and thus will have less incentive to pressure managers to cut dividends in countries where supervisors are stricter in their approach to assess and verify the degree of capital at risk in banks. We further examine potential differences in external corporate governance mechanisms, motivated by existing literature on non-financial firms which finds that market competition (Grullon & Michaely, 2012; Knyazeva & Knyazeva, 2012) and transparent and well-functioning

[e] As for non-financial firms, the existing literature on bank dividend policy has paid most of its attention to the agency conflict between managers and shareholders, showing that dividend payments are used as a signaling mechanism to convince shareholders that they will not be expropriated (Abreu & Gulamhussen, 2013; Bessler & Nohel, 1996; Dickens et al., 2002; Filbeck & Mullienaux, 1993, 1999; Floyd et al., 2015; Theis & Dutta, 2009).

markets (Brockman & Unlu, 2011) can be either substitutes or complements to dividend policies in reducing agency conflicts.

To carry out our empirical investigation, we follow La Porta et al. (2000) and Brockman and Unlu (2009) in proxying the strength of the agency costs of equity and debt by the level of shareholder protection and creditor rights, respectively. We use a panel of 1,148 listed banks from 51 countries with considerable heterogeneity in shareholder and creditor rights across countries. Limiting our analysis to listed banks having a dispersed ownership structure allows us to focus on the two potential agency conflicts between managers vs shareholders and shareholders vs creditors. We find that bank managers strike a balance in their dividend policy that depends on the relative strength of the agency conflicts faced by their shareholders and creditors, with however a more decisive role played by shareholders. We also find that dividend payments are used by managers to reinforce their reputation as perceived by debtholders when banks' levels of capital stringency or of market funding are low, and also in the presence of either strong competition in the banking market, well-functioning financial markets, or strong law enforcement. Our results further demonstrate that dividend payments are used by managers to signal to shareholders that they will not be expropriated, independently of bank funding structure, well-functioning financial markets or competition in the banking market. This implies that, for shareholders, the potential to be expropriated is not reduced by any of these factors. Furthermore, we observe that dividend payments do not depend on the strength of the agency costs of equity and debt for banks with low capital adequacy ratios, indicating that managers are restrained from using dividends as a signaling instrument when regulatory capital levels are low.

Our paper contributes to the literature in several ways. First, our study contributes to the wider literature examing how bank regulation impacts on bank behavior, which is of particular importance in our context as dividend policy in itself may have consequences for the implemenation of common bank capital regulation. Second, we contribute to the literature on corporate payouts by analyzing if bank managers adopt a balancing strategy in their dividend policy that depends on the relative strengths of the agency conflicts faced by their shareholders and debtholders. Third, our results are relevant for bank governance more particularly, as banks' highly leveraged funding structures in connection with the deposit insurance guarantees enjoyed by some, if not all, creditors might significantly interfere with agency conflicts between their stakeholders more generally.

Section 2 now discusses related literature and the hypotheses tested; Section 3 describes our empirical sample and the proxies used to measure the strength of the agency cost of equity and debt; Section 4 outlines the methodology used to test our hypotheses; Section 5 presents and discusses our main results; Section 6 examines further issues and carries out several robustness checks, and Section 7 concludes the paper.

2. Review of related literature and hypotheses tested

Following the seminal contributions of Jensen and Meckling (1976), a large strand of the theoretical literature demonstrates that dividend policies address agency conflicts between managers and shareholders (Easterbrook (1984); Jensen (1986); Zwiebel (1996); Lang and Litzenberger (1989); Gomes (2000); Chae et al. (2009)). Several empirical studies, mainly focussing on U.S. non-financial firms, find that dividends are used by managers to communicate information to shareholders when there is a conflict of interest (Denis et al., 1994; Healy & Palepu, 1988; Yoon & Starks, 1995), whereas other studies do not find evidence that dividends are used as a signaling device (Benartzi et al., 1997; Li & Zhao, 2008). La Porta, et al. (2000) furthermore contrast empirically the outcome hypothesis that non-financial firms' dividend payments increase in the strength of shareholder rights, and the substitution hypothesis that those located in countries with weaker shareholder rights pay more dividends to bolster their reputation; they find support for the outcome model, showing that dividend policies depend on the legal protection of shareholders.

Of similar importance is the agency conflict of debt, which arises between shareholders and debtholders. Shareholders can transfer wealth from debtholders by choosing strategies that increase debtholders' risk. First, managers can take on riskier projects than the risk profile of their current portfolio, benefiting shareholders while shifting risk to debtholders (Jensen & Meckling, 1976). Second, managers in a firm with risky debt financing may engage in suboptimal investment, and instead use the funds to pay dividends to shareholders (Kalay, 1982; Myers, 1977). Dividend policies can be used to solve this agency problem by paying lower levels of dividends.

The balancing strategy faced by managers stemming from the conflicting interests of shareholders and debtholders was examined for the case of non-financial firms by Brockman and Unlu (2009), who empirically investigate the impact of the agency costs of equity and debt on

non-financial firms' dividend policy. Analogously to La Porta, et al. (2000), they proxy the relative strengths of the agency cost of equity and debt with the level of shareholder protection and creditor rights. Brockman and Unlu (2009) additionally hypothesize that low dividend payments serve as a substitute mechanism for weak creditor rights, as managers will be more likely to consent to restrictive dividend policy when creditor rights are weak, in order to build reputation in financial markets. Their results show that weak creditor rights lead to lower dividend payouts while weak shareholder rights are associated with higher dividend payments, in line with the substitution hypothesis and the outcome hypothesis, respectively. They further find that creditors play a more decisive role in determining the dividend policy of non-financial firms than shareholders. Shao, et al. (2013) find further evidence that the substitution hypothesis between non-financial firms' dividend policy and weak creditor rights only holds in countries with strong shareholder protection. Another strand of literature analyses the conflict of interest between shareholders and creditors using the stock and bond price reactions to specific corporate events (Billett et al., 2004). Using the announcement of unexpected dividend changes, Tsai and Wu (2015) highlight a positive relationship between unexpected changes of dividend payments and bond returns. This result indicates that bondholders perceive such changes either as a signal sent by managers about firm profitability or as a way to prevent empire building, and not as a wealth transfer from creditors to shareholders. Another approach used in the literature to measure the strength of the shareholder-creditor conflict relies on the existence of dual holders who simultaneously hold equity and debt claims of the same firm (Bodnaruk & Rossi, 2016; Jiang et al., 2010). Building on this approach, Chu (2017) shows that firms pay lower dividends when there is diminished conflict between shareholders and creditors; this suggests that the shareholder-creditor conflict leads firms to higher pay outs to the detriment of creditors. What emerges from this literature on non-financial firms is that creditors appear to play a more decisive role than shareholders in determining the dividend policy of non-financial firms. In contrast, we would expect creditors playing a less determinant role than shareholders in bank dividend policy.

Banks have several characteristics that distinguish them from other industries, and are heavily regulated in response to significant negative externalities associated with their failure. Banks are highly leveraged and have heterogeneous sources of funding, which can come from both retail depositors and wholesale funding, each of which might behave differently in regard to bank

dividend policies. Banks generally have a large number of small depositors, which either have little incentive to monitor managers individually due to a free rider problem, or are covered by deposit insurance. Moreover, uninsured creditors' incentives to discipline managers may depend on the implementation of implicit government guarantees, such as bail-out packages, which may reduce incentives to monitor bank managers (Gropp, et al., 2014; Karas, et al., 2013). This leads us to examine the following hypothesis:

H1: Agency conflicts related to shareholders dominate those related to debtholders in the determination of bank dividend policy.

However, Kauko (2012) theoretically shows that dividends can be an important source of information for uninsured depositors as a potential signal of both profitability and liquidity. Banks have been shown to use dividends to signal asset quality and liquidity, particularly during periods of financial turmoil (Calomiris & Nissim, 2014; Forti & Schiozer, 2015). Banks that strongly rely on wholesale funding might threfore have stronger incentives to put pressure on managers to pay less dividends, in particular in countries with weak creditor rights. This leads to the following hypothesis:

H2: The impact of agency conflicts related to debtholders is stronger the greater the extent of bank market funding and the weaker are creditor rights.

Regulatory constraints on bank capital may also influence managerial decisions on dividend payments. Agency conflicts between shareholders and debtholders might matter less in countries with higher capital stringency, i.e. where supervisors are stricter in their approach to assess and verify the degree of capital at risk in banks. In such an environment, creditors would be more confident that banks are sound and thus not view larger dividends as an expropriation mechanism. We examine this issue through the following hypothesis:

H3: Agency conflicts related to debtholders have a greater impact on dividend policy in countries with weaker capital stringency.

Independently of this, banks that are well-capitalized would generally be exposed to dividend policy that is driven by the conflicting pressures brought by shareholders and debtholders. However, when banks are undercapitalized, their dividend policy might be driven by conflicting

influences. During periods of stress, banks need to reach a balance between retaining capital within the bank and sending a negative signal to market participants by cutting dividends. As reducing dividends should be less costly than issuing capital, shareholders and creditors might put equal pressure on managers to increase the regulatory capital ratio by cutting dividends. In line with this argument, consistent with the precautionary view of bank capital (Berger et al., 2008), several studies find that undercapitalized banks make lower dividend payments (Abreu & Gulamhussen, 2013; Casey & Dickens, 2000; Theis & Dutta, 2009). This leads to the following hypothesis:

H4: Agency conflicts related to both shareholders and debtholders have a lesser impact on bank dividend policy for undercapitalized banks.

We next present the data, the variables we construct and the methodology we use to examine these hypotheses.

3. Data and measures of agency conflicts

3.1 Sample selection

We focus on banks in the 72 countries for which Djankov et al. (2008b) and Djankov et al. (2007) report information on both shareholder rights and creditor rights, which we use as proxies for agency cost of equity and agency cost of debt, respectively. As we concentrate on the potential agency conflicts between managers vs shareholders and shareholders vs creditors, we only use for our analysis listed banks with a dispersed ownership structure.

We extract annual financial statement data from BvD Bankscope for the 2001 to 2014 period for bank holding companies, commercial banks, cooperative banks, and savings banks, using consolidated statements when available, and unconsolidated ones otherwise. [f] BvD Bankscope provides financial statement data for 3,235 active banks for at least some of the period considered. Following La Porta, et al. (2000), we exclude countries with mandatory dividend rules (i.e., legal requirements that dividends have to be larger than some fraction of net income), which are Brazil, Chile, Colombia, Greece, Venezuela, and Uruguay. We further exclude New Zealand, as in Leaven and Levine (2009), as almost all banks there are subsidiaries of Australian

[f] For most banks globally, with the exception of the US, financial statement data is not consistently available on a quarterly basis.

banks. After these exclusions, we have 66 countries left with 2,787 banks. After eliminating banks without information regarding dividends, we are left with 2,368 banks. Furthermore, as our objective is to focus on the conflict of interest between shareholders and managers, we further exclude the 371 banks for which the largest shareholder holds more than 51% of the shares. We also exclude the 672 banks for which we do not have information on their ownership structure, using either BvD Bankscope, Bloomberg, Thomson One Banker or their annual report when available. This leaves us with 1,325 banks. We also exclude observations where banks have negative dividends, negative equity to total assets, and dividends to net income ratios greater than 100%. After some further data cleaning of bank-level variables and requiring banks to have complete information on the relevant bank-level and country-level variables, we end up with a final sample of 1,148 banks (7,336 observations) from 51 countries; Table A1 in Appendix A gives a breakdown of these by country.

3.2. Proxies for strength of agency conflicts

We follow La Porta et al. (1998) by proxying the strength of the agency conflict between managers and shareholders (agency cost of equity) with the anti-director index ($ShareholderRights_j$), computed by La Porta, et al. (1998) and revised by Djankov, et al. (2008b). This index measures the level of shareholder rights for each country, i.e. the legal protection of shareholders against expropriation by managers through several measures: (i) if a country allows shareholders to mail their proxy vote to the firm, (ii) whether or not shareholders are required to deposit their shares prior to the General Shareholders' Meeting, (iii) whether cumulative voting or proportional representation of minorities on the board of directors is allowed, (iv) if an oppressed minorities mechanism is in place, (v) if the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median), and (vi) if shareholders have preemptive rights that can only be waived by a shareholders' vote. The index ranges from 0 to 6, with a higher value indicating better shareholder rights (see Table 1).

We proxy the strength of the agency conflict between shareholders and debtholders (agency cost of debt) by using the creditor rights index ($CreditorRights_j$), as in Brockman and Unlu (2009). This index, taken from La Porta, et al. (1998) and Djankov, et al. (2007), measures the legal protection of creditors in case of reorganization or liquidation of the debtor. It represents

several elements: (i) if creditors' consent is required to file for reorganization, (ii) if secured creditors are able to take possession of collateral assets once the reorganization petition has been approved (no automatic stay), (iii) if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, and (iv) whether the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4, with higher values indicating stronger creditor protection (see Table 1).

[Insert Table 1]

3.3. Some descriptive statistics

Dividends are expressed as the dividends to net income ratio (DP_{ijt}), the payout ratio decided by banks. It is the most commonly used measure of dividend payouts and captures the main element of the payout policy (Byrne & O'Connor, 2012; Francis et al., 2011; Mitton, 2004; Onali, 2014). The comparison of the dividend payout ratio between countries with relatively weak and strong levels of shareholder and creditor rights shows that we have substantial heterogeneity in shareholder and creditor rights across countries (see Table A1 in Appendix A). Table 2 further shows that banks located in countries with weaker shareholder rights have significantly higher dividend payouts than banks in countries with stronger shareholder rights, in line with the substitution hypothesis of La Porta, et al. (2000). We further observe that banks pay lower dividends in countries with weaker creditor rights; this is consistent with the substitution hypothesis of Brockman and Unlu (2009), with banks paying dividends as a substitute to weaker creditor rights to build their reputation.

[Insert Table 2]

4. Methodology

4.1. Empirical specifications

We use different specifications to test our four hypotheses developed above.

Specification to test hypothesis H1

We first investigate whether the strength of the agency conflicts between managers and shareholders and between shareholders and debtholders have an impact on bank dividend policy,

and whether the agency conflicts related to shareholders dominate those related to debtholders. For that, we estimate the following equation:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 CreditorRights_j + \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \alpha_t + \varepsilon_{ijt} \quad (1)$$

where subscript *i* denotes bank; *j* denotes country; *t* the time period, and ε is the idiosyncratic error term. DP_{ijt} is the dividend payout of bank *i* in country *j* at date *t*; $ShareholderRights_j$ and $CreditorRights_j$ are proxies measuring the strength of the agency conflicts of equity and the agency conflict of debt, respectively. $BankControl_{ijt}$ are bank control variables, and $CountryControl_{jt}$ are country control variables, as defined later in Section 4.2.

We expect the coefficients associated with $ShareholderRights_j$ and $CreditorRights_j$ to be significant if the agency conflicts related to shareholders and to debtholders influence bank dividend policy. However, we expect a stronger economic impact of the agency conflicts related to shareholders compared with those related to debtholders to be in line with hypothesis H1.

A positive relationship between $CreditorRights_j$ and dividend payouts is expected if managers consent to debtholders' demands for more restrictive payout policy, as a substitute for weak creditor rights, with the aim to minimize the firm's agency costs of debt. Regarding $ShareholderRights_j$, we expect a positive coefficient if shareholders with stronger rights force managers to pay more dividends, in line with the outcome model proposed by La Porta, et al. (2000). On the other hand, a negative relationship would support the substitute model of La Porta, et al. (2000), where dividends are considered as a substitute for legal protection. This implies that dividend payout ratios should be higher in countries with lower levels of shareholder protection than in countries with stronger levels of protection.

Specification to test hypothesis H2

We next examine whether managers have stronger pressure to pay less dividends in banks that strongly rely on wholesale funding, in particular in countries with weak creditor rights. For this we augment Eq. (1) with interaction terms between the proxies measuring the strength of agency conflicts and the dummy variable $HighMarketFund/TF_{ijt}$; the dummy variable takes the value of

one if the ratio of long term market funding to total funding (deposits and wholesale funding[g]) is greater than the country-sample median, and zero otherwise.[h] This results in the following specification:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 ShareholderRights.HighMarketFund/TF_{ijt} + \beta_3 CreditorRights_j + \beta_4 CreditorRights.HighMarketFund/TF_{ijt} \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \alpha_t + \varepsilon_{ijt} \quad (2)$$

We expect the coefficient associated with the interaction term $CreditorRights.HighMarketFund/TF_{ijt}$ to be significant and positive to be consistent with hypothesis H2 that the pressure exerted by debtholders to cut dividends is stronger the greater the extent of bank market funding and the weaker are creditor rights. On the other hand, we do not expect the coefficient associated with $ShareholderRights.HighMarketFund/TF_{ijt}$ to be significant as we do not expect the pressure exerted by shareholders to pay more dividends to depend on the magnitude of wholesale funding.

Specification to test hypothesis H3

We furthermore investigate whether the pressure exerted by debtholders on bank dividend policy depends on capital regulatory requirements. In countries with high capital stringency, creditors might be more confident to recover their claims and thus will have less incentive to pressure managers to cut dividends. Hence, greater capital stringency may act as a substitute mechanism for dividend payments in countries with weaker creditor protection. We test hypothesis H3 by augmenting Eq. (1) with interaction terms between the proxies measuring the strength of agency conflicts and the dummy variable $HighCapString_{jt}$ that takes the value of

[g] For data reasons, we have to exclude short term market funding to ensure that we only consider uninsured debtholders. Short term market funding in BvD Bankscope comprises senior debt maturing in less than one year, money market instruments, certificates of deposit, commercial paper, margin deposits, but also corporate deposits (made by large commercial companies, public institutions, government agencies and large non-profit institutions) that benefit from the deposit insurance guarantee. We use the ratio of short term and long term market funding to total funding as a robustness check (see Section 6.2.).

[h] As we only have five countries with no explicit deposit insurance over the period considered, for a low number of observations, and similarly only four countries that adopted a deposit insurance system throughout the period, we cannot use a dummy variable to differentiate these countries from the ones having an explicit deposit insurance scheme. Moreover, the creditor and shareholder rights indices are very similar across these countries.

one for countries having stronger capital stringency, and zero otherwise. This results in the following specification:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 ShareholderRights.HighCapString_{ijt} + \beta_3 CreditorRights_j + \beta_4 CreditorRights.HighCapString_{ijt} \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \alpha_t + \varepsilon_{ijt} \quad (3)$$

We use the Capital Stringency index (*CapString*$_{jt}$) developed by Barth et al. (2004), which determines the nature of capital requirements and how capital is assessed and verified by banks and regulators; it ranges in principle from 0 to 11, where 11 represents the highest level of capital stringency (see the definition in Table 1 for more details). We follow the method described by Barth et al. (2013) to harmonize this index across the four surveys available from the World Bank's Bank Regulation and Supervision program during our period of study. The dummy variable *HighCapString*$_{jt}$ takes the value of one for a country if the index *CapString*$_{jt}$ is greater than the cross-country median at date *t*, and zero otherwise.

We expect a greater impact of the proxy measuring the agency cost of debt on bank dividend policy in countries with weaker capital stringency ($\beta_3 > \beta_3 + \beta_4$) to be in line with hypothesis H3.

Specification to test hypothesis H4

Finally, we examine whether the pressure exerted by shareholders and debtholders on bank dividend policy is weaker for undercapitalized banks. To examine this aspect we augment Eq. (1) with interaction terms between the proxies measuring the strength of the agency conflicts and the dummy variable *Undercapitalized*$_{ijt}$, leading to the following specification:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 ShareholderRights.Undercapitalized_{ijt} + \beta_3 CreditorRights_j + \beta_4 CreditorRights.Undercapitalized_{ijt} \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \alpha_t + \varepsilon_{ijt} \quad (4)$$

We compute bank capital as the ratio of equity to total assets ($Equity/TA_{ijt}$) for each bank, and then obtain its country median for each date *t*. We then classify a bank as undercapitalized at date *t* if its equity to total assets ratio is lower than the country median ratio. The dummy variable $Undercapitalized1_{ijt}$ takes the value of one if a bank is classified as undercapitalized at date *t*, and zero otherwise. We alternatively use the total regulatory capital ratio (TCR_{ijt}) to identify banks that are undercapitalized. A bank is in this case classified as undercapitalized if its regulatory capital ratio is lower than the country regulatory threshold plus two percent. We then compute the dummy variable $Undercapitalized2_{ijt}$ as taking the value of one if a bank is classified as undercapitalized at date *t*, and zero otherwise.

We expect, to be in line with hypothesis H4, that bank dividend payments are significantly influenced by the strength of the agency cost of equity and debt for well-capitalized banks (β_1 negative and β_3 positive), while this should not hold for undercapitalized banks ($\beta_1 + \beta_2$ and $\beta_3 + \beta_4$ non significant).

4.2. Control variables

The description and data sources of each control variable are presented in Table 1, with associated summary statistics.

We follow the existing literature and control for both individual (X_{ijt}) and country-level (Z_{jt}) effects that might also influence dividend payments. The literature on non-financial firms generally uses the natural logarithm of total assets ($Size_{ijt}$) for firm size, the return on assets as a profitability measure (ROA_{ijt}) and the asset growth rate ($AssetGrowth_{ijt}$) for investment opportunities. We expect large and more profitable banks to pay higher dividends, while banks with high growth opportunities can be expected to retain earnings to avoid costly equity and debt financing. We also control for the potential impact of taxation on dividend policy; for this we use data on individual income tax rates (Tax_{jt}) provided by KPMG. The banking literature suggests that bank risk may increase dividend payouts due to risk-shifting motives (Acharya et al., 2013; Kanas, 2013; Onali, 2014); we therefore include the logarithm of a time-varying Z-score, based on 3-year rolling windows, ($LnZscore_{ijt}$) to proxy bank default risk[i] (see Table 1 for the definition).

[i] Higher Z-scores mean lower probabilities of default; see Lepetit and Strobel (2015) and Lepetit and Strobel (2013) for derivation and time-varying implementation of Z-score measures, respectively.

Grullon and Michaely (2012) argue that product market competition influences managers' decisions on the dividend policy of non-financial firms. To allow for this, we compute a country-level Lerner index ($Lerner_{jt}$) as the average of bank-level Lerner indices by country and by year (see Appendix B for more details).[j] For this, we consider not only listed banks but also non-listed ones to measure the degree of competition in the entire banking system. Higher values of the Lerner index indicate greater market power, i.e. lower competition in the banking industry. We then compute a dummy variable for countries with a higher level of competition in the banking industry ($HighCompetition_{jt}$), taking the value of one if the Lerner index for country *j* at date *t* is lower than the sample median, and zero otherwise. We also follow Brockman and Unlu (2011) and include a variable to control for financial market development, using the market capitalization to GDP ratio as a proxy for financial market depth ($CapDepth_{jt}$). We compute the dummy variable $HighCapDepth_{jt}$ that takes the value of one if the variable is greater than the sample median at date *t*, and zero otherwise. We also allow for possible changes in dividend policy during periods of banking crises by including the dummy variable ($Crisis_{jt}$) that takes the value of one if there is a banking crisis in country *j* at date *t* (as defined in the Global Financial Development Database of the World Bank), and zero otherwise. Acharya, et al. (2011) report that banks in the U.S. and in Europe had been paying out significant dividends before the 2007-2008 crisis, but also continued to do so during that crisis period. Kanas (2013) provides evidence that the Prompt Corrective Action framework was ineffective in curbing dividend behavior. Abreu and Gulamhussen (2013) find that even U.S. bank holding companies that were undercapitalized before the financial crisis of 2007-2008 paid higher dividends, but stopped doing so during the financial crisis when regulatory pressure was greater.

To complete our specification, we also include year fixed effects. For Eq. (1), we furthermore include the dummy variables $HighMarketFund/TF_{ijt}$, $HighCapString_{jt}$ and $Undercapitalized1_{ijt}$.

We check for the absence of multicollinearity problems in our core variables by computing the correlation matrix (see Table A2) and the variance inflation factors (VIF), which have a mean value of 1.98 with a maximum of 2.58. Despite the fact that the variables *ShareholderRights* and

[j] We initially computed Panzar-Rosse H-statistics, following Claessens and Laeven (2004) and Bikker et al. (2012). However, Panzar-Rosse H-Statistics are only valid if the market is in equilibrium in the long run. We performed the equilibrium test used by Claessens and Laeven (2004), and found that 23 countries (out of 51) do not satisfy this requirement.

CreditorRights have a correlation of 0.5, we do not have a collinearity problem as the standard errors of both *ShareholderRights* and *CreditorRights* do not inflate.

4.3. Methods of estimation

As the shareholder and creditor protection measures are time invariant, we could use random effects estimation (RE), or otherwise the Hausman-Taylor (HT) estimator to run Eqs. (1)-(4). To determine which is better, we initially estimate Eq. (1) using random effects (RE), the Hausman-Taylor (HT) estimator and also fixed effects (FE). The Hausman specification test on FE and RE rejects the null hypothesis. In this case, RE is an inconsistent estimator. However, the Hausman test between FE and HT does not reject, indicating that HT is as consistent as FE, yet more efficient than FE (Baltagi et al., 2003). Thus, we use HT to estimate Eq. (1). We perform Hausman tests on the difference between FE and HT to test if the choice of exogenous variables is legitimate; we also use this test to choose the best combination that maximizes the p-value of the test (Baltagi, et al., 2003). We find that the variables $ShareholderRights_j$, $CreditorRights_j$, $HighCapString_{jt}$ and $HighCapDepth_{jt}$, are strictly exogenous, while all time-variant bank level variables are endogenous; hence, the HT estimator is used throughout.

Given the previous strong argument in favor of using the Hausman-Taylor estimator for our core specification Eq. (1), we also use the HT estimator for the subsequent specifications Eqs. (2)-(4), but run using subsamples defined by the corresponding dummy variables $HighMarketFund/TF_{ijt}$, $HighCapString_{jt}$, $Undercapitalized1_{ijt}$ and $Undercapitalized2_{ijt}$. Our underlying rationale for taking this qualitatively equivalent approach is, firstly, that the HT estimator is well known to be inherently difficult to apply in specifications with interaction terms, as it multiplies the number of valid instruments required. Secondly, whereas we noted previously that there is no issue with collinearity problems between the variables $ShareholderRights_j$ and $CreditorRights_j$ themselves, this clearly cannot be said about the interaction terms. The interaction terms of variables $ShareholderRights_j.Factors$ and $CreditorRights_j.Factors$[k] in specifications Eqs. (2)-(4) are highly correlated, with correlation coefficients around 0.8 or higher; this implies that the estimated coefficient of the interaction

[k] Where *Factors* refer to either dummy variables $HighMarketFund/TF_{ijt}$, $HighCapString_{jt}$ and $Undercapitalized1_{ijt}$ as in specifications Eqs. (2)-(4), respectively. The correlation for *ShareholderRighst.HighMarketFund/TF* and *CreditorRighst.HighMarketFund/TF* is 0.87, for *ShareholderRights.HighCapString* and *CreditorRights.HighCapString* is 0.86, and for *Undercapitalized.HighCapString* and *Undercapitalized.HighCapString* is 0.87.

terms will have a very high standard error due to the multicollinearity problem. We therefore follow Knyazeva and Knyazeva (2012) and Shao et al. (2013), who encounter similar problems, and use subsamples analysis based on Eq. (1) as a qualitatively equivalent alternative to augmenting the latter with interactions terms.

5. Results and discussion

5.1. Strength of agency conflicts and bank dividend policy

We report the estimation results of Eq. (1) using the Hausman Taylor (HT) estimator, random effects (RE) and also fixed effects (FE) in Table 3; robust standard errors are clustered at the bank level. Comparing the three estimators, one can observe that they produce very similar results, in terms of sign, significance, and magnitude; based on the specification tests carried out, the HT estimator (column 1) is used for the main and all further regressions.

Our results show that banks' dividend payout ratios are influenced by the relative strengths of the agency costs of equity and debt. We find a negative and significant coefficient associated with the variable $ShareholderRights_j$, at a one percent level of confidence. These results indicate that bank managers located in countries with weaker shareholder rights pay higher dividends, as a substitute mechanism for legal protection, with the aim to bolster their reputation by signaling their unwillingness to expropriate shareholders. The results we find for banking firms are therefore markedly different from those obtained by La Porta, et al. (2000) and Brockman and Unlu (2009) for non-financial firms, who find evidence in favor of the outcome hypothesis. On the other hand, the coefficient associated with the variable $CreditorRights_j$ is positive and significant at a one percent level of confidence. This is consistent with the substitution hypothesis of Brockman and Unlu (2009), as bank managers pay less dividends in countries with weak creditor rights. This result shows that bank managers consider not only the interests of shareholders in their dividend policy decisions, but also those of creditors. This holds even if a large proportion of creditors is protected by deposit insurance, and uninsured creditors might benefit from implicit government guarantees. Behaving in such a way will strengthen managers' reputation *vis-à-vis* a bank's creditors, and might thereby reduce future financing costs.

However, examination of the economic significance of our results shows that shareholder rights have a stronger impact than creditor rights in line with hypothesis H1. In particular, the estimation result in column 1 implies that a ten percent increase in the shareholder rights index

corresponds to a decrease in the payout ratio of 5.1% on average, ceteris paribus. On the other hand, an increase of ten percent in the creditor rights index increases the dividend payout ratio by 2.06% on average. Our results that cross-country differences in shareholder rights have a more substantial impact than those in creditor rights, are in contrast to those found by Brockman and Unlu (2009), who observe that the impact of creditor rights on dividend policy is stronger than the one of shareholder rights for non-financial firms. This difference could be explained by the unique structure of banks' funding and the pervasive safety net policies protecting creditors that reduce creditors' incentives to discipline managers.

Our results further show that bank specific factors have a significant influence on bank dividend policy. We find that banks located in countries with stronger capital stringency pay higher dividends compared to banks under less regulatory pressure. We also find that undercapitalized banks pay less dividends, possibly to satisfy their capital requirements. Furthermore, banks with a higher proportion of funding provided by uninsured debtholders distribute more dividends. This result shows that uninsured debtholders of banks are unwilling to exert pressure on managers to pay less dividends. For the other control variables, our results show that banks which are larger, more profitable and have lower growth perspectives pay higher dividends, in line with Fama and French (2001). We also find that banks give lower dividend payouts when their risk is higher. This result supports the empirical finding of Hoberg and Prabhala (2009), who also show that firms' propensity to pay dividends is lower when their risk is higher. We also find that banks pay higher dividends in countries with stronger competition in the banking industry and greater capital market depth. We do not find a significant impact of taxation on dividend payments. As banks in our sample have a dispersed ownership structure, this result is in line with Jacob et al. (2016), who find that dividend tax sensitivity sharply declines as the number of owners increases. Finally, our results show that banks pay higher dividends during crisis periods. This finding is in line with Acharya, et al. (2011) who show that during the global financial crisis in 2007-2008, banks kept paying very high dividends.

Overall, our empirical results show that dividend payments are a substitute mechanism for low levels of legal protection for both shareholders and creditors. Bank managers strike a balance in their dividend policy that depends on the relative strength of the agency conflict faced by their shareholders and creditors, with however a more decisive role played by the agency cost

of equity than the agency cost of debt. Our findings also show that bank funding structure, capital stringency and levels of capitalization have a significant influence on the dividend policy of banks. We are taking our investigation further now, by examining whether the way in which managers are subject to shareholders' and managers' pressures is also influenced directly by these different factors.

[Insert Table 3 here]

5.2. Differential impact of bank specific factors

5.2.1. Funding structure

We first examine hypothesis H2 that the pressure exerted by debtholders on bank dividend policy is stronger the greater the extent of uninsured market funding and the weaker are the creditor rights. As explained above, analogously to running Eq. (2), we estimate Eq. (1) on separate samples for banks with either lower or higher levels of long term market funding; results are provided in Table 4, columns 1 and 2. Our results show that the substitution hypothesis between dividend payments and weak creditor rights only applies for banks with a low level of market funding. This result is not in line with hypothesis H2 that a larger proportion of funds provided by uninsured debtholders might put pressure on managers to pay less dividends in countries with weaker creditor rights. However, it might indicate that more reliance on wholesale funding implies higher exposure to market scrutiny, which might lead to better alignment of the interests of managers and creditors, reducing the need to use dividends as a signaling mechanism. We further find that the substitution hypothesis between dividend payments and weak shareholder rights holds irrespective of the level of market funding. This indicates that shareholders consider that the level of market funding does not affect the willingness of managers to expropriate them. Looking at the economic significance of our results, we find that shareholder rights have a stronger impact than creditor rights in the case of low market funding.

5.2.2. Capital stringency

We next analyze if greater capital stringency can be a substitute mechanism for dividend payments in countries with weak legal protection. If this were the case, we would expect dividend payments to be used by managers to reinforce their reputation, for both shareholders

and creditors, only in countries with weak legal protection. We re-run Eq. (1) on separate samples for countries with either lower or higher capital stringency (analogously to running Eq. (3)). We find a significant and positive relationship between the level of creditor rights and the dividend payout ratio, but only in countries with lower capital stringency (Table 4, columns 3 and 4). The substitution hypothesis between dividend payments and weak creditor rights that we observed as holding for the full sample now only applies in countries where capital stringency is relatively low. This is consistent with the hypothesis H3 that high capital stringency can override managers' incentives to signal their reputation by paying less dividends in countries with weaker creditor protection. We also find that the substitution hypothesis between dividend payments and shareholder rights only holds in countries with higher levels of capital stringency. This implies that, from the perspective of shareholders, potential for managers to expropriate them is not reduced by higher degrees of capital stringency, in contrast to debtholders. Examination of the economic significance of our results reconfirms that shareholder rights have a stronger impact than creditor rights in the case of low capital stringency.

5.2.3. Level of capitalization

We also similarly investigate the role played by the level of capitalization in this context. The results in Table 4 (columns 5 and 6) show that the relationship between dividend payments and shareholder rights is not affected by the level of bank equity. We find that the substitution hypothesis between dividend payments and creditor rights holds only for banks with a relatively high level of capitalization, irrespective of the measure of capitalization used, in line with hypothesis H4. The reason for the substitution hypothesis not holding for banks with lower levels of regulatory capital could be that managers are restrained from using dividends as a signaling instrument when regulatory capital levels are low. Our results also indicate that shareholders do not consider that the level of bank equity might affect the incentives of managers to engage in expropriation. However, when we consider the level of the capital adequacy ratio instead of the leverage ratio, we find that the substitution hypothesis between dividend payments and weak shareholder rights only holds for banks with a regulatory capital ratio well above minimum requirements (columns 7 and 8), again in line with hypothesis H4. As for the economic significance of our results, we again observe that shareholder rights have a stronger impact than creditor rights when levels of capitalization are high.

[Insert Table 4]

6. Further issues and robustness checks

6.1. Extensions

We now examine several additional factors that could also have an impact on how dividend payments are influenced by the strength of the agency conflicts related to shareholders and debtholders: the quality of law enforcement, the degree of financial market efficiency, the degree of bank competition, and the level of bank risk. For that, we augment Eq. (1) with interaction terms between the proxies measuring the strength of the agency conflicts and the dummy variable $Factor_{ijt}$ as follows:

$$DP_{ijt} = \beta_0 + \beta_1 ShareholderRights_j + \beta_2 ShareholderRights.Factor_{ijt} + \beta_3 CreditorRights_j + \beta_4 CreditorRights.Factor_{ijt} + \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \alpha_t + \varepsilon_{ijt} \quad (5)$$

The first factor we consider is the quality of law enforcement. As highlighted by Claessens and Yurtoglu (2013), while the formal definition of property rights matters, the degree of enforcement of these rights is also an important determinant of the strength of conflicts of interest between managers and their stakeholders; this could therefore have an impact on the relationship between dividend policy and shareholder and creditor rights. To examine this aspect, we use two alternative indices to measure the quality of enforcement of legal rights in the judicial system: an index measuring the quality of law enforcement (the rule of law index from Worldwide Governance Indicators (World Bank)) and an index of the efficiency of debt enforcement computed by Djankov et al. (2008a). The rule of law index, ROL_{jt} reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts; it ranges from -2.5 to 2.5, with a higher index indicating stronger law enforcement. The efficiency of debt enforcement index $DebtEnforcement_j$ is computed using detailed information on collateral systems, structure of appeals, efficiency of votes among creditors, and bankruptcy systems; it ranges from 0 (weak enforcement) to 100 (strong enforcement).

Secondly, we examine whether efficient financial markets and bank competition may act as either substitutes or complements to dividend policies in reducing agency conflicts. Well-

functioning and efficient financial markets are important to enable the different stakeholders to better distinguish good from bad managers as well as profitable from negative value investment projects (Holmstrom & Tirole, 1993). We use several indicators reflecting different aspects of whether financial markets are well-functioning and efficient. First, to represent the degree of financial market development, we use the market capitalization to GDP ratio as a proxy for financial market depth ($CapDepth_{jt}$). We then use the turnover ratio, defined as the ratio of the value of total shares traded to market capitalization, to measure the efficiency of the stock market ($CapEfficiency_{jt}$). Higher turnover compared to capitalization represents relatively higher volumes of trading in the market, and thus more liquidity and greater scope for price discovery, improved transmission of information through prices, and greater market efficiency. We furthermore use the disclosure requirement index provided by the World Bank to measure the quality of information disclosed in financial markets ($Disclosure_j$); it ranges from 0 to 10, with higher values indicating more extensive disclosure requirements. Regarding bank competition, we use two measures: the country-level Lerner index (described in Section 4.2.), and alternatively the Herfindahl Index (HHI_{jt}) of bank market shares in terms of total assets. It has been shown that intense product market competition impels managers to behave efficiently, with competition acting as a disciplinary force by removing incompetent managers from the market (Hart, 1983; Holmstrom, 1982). Knyazeva and Knyazeva (2012) go further by arguing that product market competition can be viewed as either an alternative or a complement to shareholder rights in aligning managerial and shareholder incentives.

Finally, we also investigate if the level of bank risk shapes the influence of shareholder and creditor rights on dividend policy. We use three alternative measures of bank risk: insolvency risk ($LnZscore_{ijt}$), bank earnings volatility ($SdROA_{ijt}$) and systematic risk ($Beta_{ijt}$), as defined in Table 1.

As for Eqs. (2)-(4), we follow Knyazeva and Knyazeva (2012) and Shao et al. (2013) and run Eq. (1) using subsamples based on high and low values of each index/variable instead of running Eq. (5) directly; results are presented in Tables 5 to 8. We find that lower creditor rights are associated with higher dividend payments, but only in countries with higher efficiency of debt enforcement (Table 5), stock market efficiency, financial market disclosure (Table 6) and competition (Table 7). These additional factors are therefore complements to creditor rights in disciplining managers. Our results also show that the substitution hypothesis between dividend

payments and weak shareholder rights holds irrespective of the levels of legal rights enforcement and financial market efficiency; this indicates that, for shareholders, the potential for being expropriated by managers is not reduced by any of these factors.

Our results in Table 8 show a negative and significant impact of shareholder rights on dividend payments irrespective of the degree of bank risk. However, the effect of creditor rights on dividend payout ratios is only significant for banks with higher bank risk. This result indicates that in countries where the agency cost of debt is high, managers of riskier banks have greater incentives to cut dividends to signal to creditors that they will not be expropriated. When bank risk is lower, creditors are more confident to be paid back their claims, and thus do not view the payment of dividends as a transfer of wealth.

[Insert Tables 5 to 8]

6.2. Robustness checks

We carry out several additional robustness checks on our empirical results.[l]

Alternative econometric specifications and method of estimation

We use the ratio of dividends to total assets (Div/TA_{ijt}) as an alternative variable to measure the dividend payout. Tables A3 and A4 (in Appendix A) show that we obtain similar results to those obtained in Tables 3 and 4 when we use this alternative measure as the dependent variable.

We then replace the variable $Undercapitalized1_{ijt}$, which is based on the equity to total assets ratio and captures the level of (under)capitalization of the bank, with the variable $Undercapitalized2_{ijt}$, which is alternatively based on the total regulatory capital ratio. Following the methodology in Lepetit et al. (2015), we alternatively use a partial adjustment model to estimate a bank-specific and time-varying target capital ratio and identify the bank's initial position relative to its target. We then compute a dummy variable which captures banks whose total equity to total assets ratio is below their target level. In both cases, our results remain unchanged; as before, banks that are undercapitalized or below their target level pay less dividends.

We also control for additional institutional and financial market features in Eqs. (1)-(4), including quality of law enforcement, efficiency of debt enforcement, stock market efficiency,

[l] Estimation results not included in this section are available on request.

and financial market disclosure. We further use two alternative measures of investment opportunities instead of the growth rate of total assets: the growth rate of total loans and the ratio of market value of equity to its book value. Again, our results remain unchanged.

We next examine if our results regarding the role played by market funding in the relationship between dividend payments and legal protection of creditors changes when we consider both long term and short term market funding. However, the results are similar to those obtained before, where we only considered long term market funding.

We furthermore use Fixed Effects Vector Decomposition (FEVD) instead of Hausman-Taylor estimations, as proposed by Plumper and Troeger (2007) and Plumper and Troeger (2011) to deal with time invariant estimation in fixed effects model. We obtain results that are again roughly similar.

Sample restrictions

We furthermore test whether our results are driven by the large presence of U.S., Japanese and Russian banks. We create three subsamples: Panel A that excludes U.S. banks, Panel B that excludes Japanese banks, and Panel C that excludes Russian banks. We reexamine our Eqs. (1)-(4); these estimations are reported in Tables A5-A8. We obtain results that are very similar to our previous findings.

Lastly, we run estimations excluding cooperative and savings banks from the sample to allow for the possibility that they might have different dividend policies. While all cooperative banks in our sample are listed, they are still partly owned by their members. As discussed by Emmons and Schmid (2002), cooperative banks could allocate benefits to their members through high deposit interest rates, low loan interest rates and dividends. They show that dividend payments depend on members' preferences, trading off higher operating profits and dividends on one hand (profit-maximizing incentive), against more favorable deposit/loan prices on the other (output-maximizing incentive). Moreover, as argued by Rasmusen (1988) and Gorton and Schmid (1999), the voting rights structure ("one member-one vote principle") does not allow the constitution of block shareholders who can monitor managers. This might increase the ability of managers to divert firm resources. Our results remain, however, unchanged when we exclude the 59 cooperative and savings banks we have in our sample (Tables A9 and A10).

7. Conclusion

We empirically investigate whether banks' dividend payments are influenced by the relative strength of the various agency conflicts occurring between different stakeholders. More specifically, we analyze whether the strength of the agency conflicts between managers and shareholders and/or between debtholders and shareholders have a significant impact on bank dividend policy on a global level. In this we follow La Porta, et al. (2000) and Brockman and Unlu (2009) in proxying the extent of the agency cost of equity and debt with the levels of shareholder protection and creditor rights, respectively. Our investigation thus contributes to the literature by examining whether or not bank dividend policy is determined by a balancing strategy between the pressures exerted by their shareholders and debtholders, taking into account banks' specific funding structure and the particular regulatory environment faced by the banking industry. To carry out this investigation, we use a panel of 1,148 listed banks from 51 countries over the 2001-2014 period.

We find that both shareholder and creditor rights significantly influence banks' dividend policy. Our results are consistent with the substitution hypothesis between dividend payments and both weak shareholder and creditor rights. These two results indicate that managers use dividends as a corporate governance mechanism to signal their unwillingness to expropriate either shareholders or creditors when their respective legal rights are weak. Looking at the economic significance of these two effects, we find that shareholder rights have a more substantial impact on dividend policy than creditor rights. This result, robust to various specifications, is in contrast to what is observed for non-financial firms; it can be explained by the unique structure of banks' funding and the pervasive safety net policies protecting creditors.

Further investigations show that dividend policy can be used as a substitute mechanism to weak creditor rights only in the presence of either stricter capital stringency, strong competition in the banking market, well-functioning financial markets with strong levels of development and high disclosure quality, or strong levels of debt enforcement. We also find that higher levels of market funding involving greater exposure to market scrutiny reduce the importance of creditor rights. Regarding the pressure exerted by shareholders on managers, we find that the substitution hypothesis between dividend payments and weak shareholder rights holds independently of the competitive environment, financial market characteristics and banks' funding structure. In other

words, shareholders do not consider that these different factors affect the incentives of managers to engage in expropriation. This could be explained by shareholders finding it difficult to detect expropriation behavior in financial firms due to banks' inherent opacity. We furthermore find that there is no significant impact of shareholder and creditor rights on dividend payments for banks with low capital adequacy ratios, indicating that managers are restrained from using dividends as a signaling instrument when regulatory capital levels are low.

Overall our study contributes to the literature by showing the relevance of the substitution hypothesis based on the agency costs of equity and of debt for the important realm of financial firms. Our study highlights that bank managers strike a balance in their dividend policy that depends not only on the relative strength of the agency conflicts faced by their shareholders and creditors, with a more decisive role played by the agency cost of equity than the one of debt, but also on a variety of bank and market specific factors and the institutional environment. Our results for financial firms are opposite to the ones found in the literature on non-financial firms, where creditors play a more determinant role than shareholders in dividend policy decisions. This striking difference can be explained by the fact that banks are "special" in the sense that they benefit from pervasive safety net policies protecting creditors, reducing their incentives to discipline managers.

The stronger pressure exerted by shareholders on the dividend decisions of managers, relative to the one of debtholders, could be viewed as harmful for banks as the interests of shareholders, unlike those of debtholders, are not generally aligned with the preferences of regulators and deposit insurers. Shareholders, particularly in countries with weak shareholder rights, prefer earnings to be distributed as dividends, reducing banks' ability to generate capital internally with a potential transfer of default risk to creditors and the deposit insurer. As our findings, however, show that undercapitalized banks do not appear to face pressures from shareholders to use dividends as a signaling mechanism, this stronger influence of shareholders on banks' dividend policy might not pose a substantial risk for banks' financial health from a prudential standpoint, and thus mitigate the need to redress this balance with further regulatory intervention.

Table 1. Variable Definition.

Variable	Definition	Source	Mean	SD	Min	Median	Max
Dependent Variables							
DP	Dividends to net income.	BvD Bankscope	28.59	22.79	0	26.07	100
Div/TA	Dividend to total assets.	ibid.	0.28	0.32	0	0.2	3.52
Country Level Variables							
ShareholderRights	Revised anti-director rights index The yes/no responses to the following elements are coded as 1/0: (i) if a country allows shareholders to mail their proxy vote to the firm, (ii) whether or not shareholders are required to deposit their shares prior to the General Shareholders' Meeting, (iii) whether cumulative voting or proportional representation of minorities on the board of directors is allowed, (iv) if an oppressed minorities mechanism is in place, (v) if the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median), and (vi) if shareholders have preemptive rights that can only be waived by a shareholders' vote. The index ranges from 0 to 6, with higher value indicating stronger shareholder protection.	La Porta, et al. (2000) and Djankov, et al. (2008b)	3.54	1.09	1	4	5
CreditorRights	Creditor rights index. The yes/no responses to the following elements are coded as 1/0: (i) if creditors' consent is required to file for reorganization, (ii) if secured creditors are able to take possession of collateral assets once the reorganization petition has been approved (no automatic stay), (iii) if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, and (iv) whether the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4, with higher value indicating stronger creditor protection.	La Porta, et al. (1998) and Djankov, et al. (2007)	2.02	1.03	0	2	4

CapString	Capital Stringency index. The yes/no responses to the following questions are coded as 1/0: (1) Is the capital-asset ratio risk weighted in line with the Basel I guidelines? (2) Is the capital-asset ratio risk weighted in line with the Basel II guidelines? (3) Does the minimum capital-asset ratio vary as a function of an individual bank's credit risk? (4) Does the minimum capital-asset ratio vary as a function of market risk? (5) Before minimum capital adequacy is determined, which of the following are deducted from the book value of capital: Market value of loan losses not realized in accounting books? Unrealized losses in the securities portfolios? Unrealized foreign exchange losses? (6) What fraction of revaluation gains is allowed as part of capital? (7) Are the sources of funds to be used as capital verified by the regulatory/supervisory authorities? (8) Can the initial disbursement or subsequent injections of capital be done with assets other than cash or government securities? (9) Can initial disbursement of capital be done with borrowed funds? We follow the methodology used by Barth, et al. (2013) to harmonize the computation of the index over the four different surveys. The index ranges from 0 to 11, with higher value indicating stricter capital stringency.	Bank regulation and supervision database (Barth, et al., 2013) - World Bank	7.75	1.53	4	8.09	11
HighCapString	Dummy variable that equals one if the value of the variable *CapString* is greater than the sample median and zero otherwise.	ibid.	0.45	0.38	0	0.38	1
Tax	Highest individual income tax rate.	KPMG	36.32	8.74	10	35	62.28
Lerner	Country-level Lerner index computed as the average of bank-level Lerner indices by country and by year (see Appendix B for the methodology used).	BvD Bankscope	0.205	0.06	0.10	0.19	0.33
HighCompetition	Dummy variable that equals one if the value of the variable *Lerner* is lower than the sample median and zero otherwise.	ibid.	0.50	0.34	0	0.52	1

CapDepth	Ratio of market capitalization to gross domestic product.	Global Financial Development Database (GFDD) - World Bank	37.02	44.93	0.18	20.73	177.46
HighCapDepth	Dummy variable that equals one if the value of the variable *CapDepth* is lower than the sample median and zero otherwise.	ibid.	0.31	0.47	0	0	1
Crisis	Dummy variable that equals one if there is a banking crisis in the country *j* at date *t* and zero otherwise.	GFDD - World Bank and country central banks	0.11	0.16	0	0	0.53
ROL	Rule of Law score captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. It ranges from -2.5 to 2.5, with higher value indicating stronger law enforcement.	World Governance Index Database - World Bank	0.51	1.00	-1.24	0.50	1.93
DebtEnforcement	Measures the efficiency of debt enforcement. The efficiency index is built using a standardized case study of an insolvent firm (a hotel about to default on its debt). This case was submitted to insolvency practitioners in 88 countries around the world. These practitioners had to describe the different procedures available by law to solve the case (foreclosure, reorganization, liquidation), which of these procedures was likely to be used in each country and whether the firm would continue (or not) operating as a going concern through and upon the completion of the insolvency process. They also had to estimate the time and the costs (court fees, attorney fees, administrator fees, liquidation fees…) associated with the different steps of these procedures. Using this information, the efficiency index is computed as the present value of the terminal value of the firm after bankruptcy costs. It ranges from 0 (weak debt enforcement efficiency) to 100 (strong debt enforcement efficiency). The higher the index, the higher the value of the firm after bankruptcy costs.	Djankov, et al. (2008a)	60.22	26.79	6.6	58.8	96.1

CapEfficiency	Ratio of value of total shares traded to market capitalization (turnover ratio).	Global Financial Development Database (GFDD) - World Bank	69.98	58.54	1.44	54.59	211.25
Disclosure	Disclosure requirement index. It measures the degrees to which corporations listed on local stock exchanges have to disclose relevant financial and other information. It ranges from 0 to 10, with higher values indicating more extensive disclosure requirements.	La Porta et al. (2006)	65.18	21.85	0	67	100
HHI	Herfindahl Index of bank market shares in terms of total assets, considering both listed and non-listed banks.	ibid.					
Bank-Level Variables							
MarketFund/TF	Ratio of long term market funding to total funding.	BvD Bankscope	9.22	13.14	0	4.45	68.76
HighMarketFund/TF	Dummy variable that equals one if the value of the variable *MarketFund/TF* is greater than the country median and zero otherwise.	ibid.	0.47	0.50	0	0	1
Equity/TA	Total equity to total assets ratio.	ibid.	9.23	4.60	0.66	8.66	70.97
Undercapitalized1	Dummy variable that equals one if the value of the variable *Equity/TA* is lower than the country median and zero otherwise.	ibid.	0.50	0.50	0	0	1
TCR	Total weighted capital regulatory ratio.	ibid.	14.23	4.14	1.1	13.43	55.39
Undercapitalized2	Dummy variable that equals one if the value of *TCR* is lower than the country regulatory threshold plus two percent and zero otherwise.	ibid.	0.05	0	0	0	1
Size	Natural logarithm of total assets.	ibid.	15.05	2.19	10.50	14.46	20.74
ROA	Return on assets.	ibid.	0.83	0.96	-6.20	0.84	7.10

AssetGrowth	Annual growth of total assets.	ibid.	10.87	15.60	-25.40	6.97	121.82
LnZscore	Natural logarithm of Z-score. Z-score is defined as: ($MROA_{ijt}$+ $Equity/TA_{ijt}$)/$SdROA_{ijt,}$ where $MROA_{ijt}$ and $SdROA_{ijt}$ are the moving average and standard deviation of return on assets (with a window width of 3 years), and $Equity/TA_{ijt}$ is the equity to total assets ratio at date *t*. Higher Z-scores mean lower probabilities of default.	ibid.	3.99	1.13	-0.06	4.08	6.56
SdROA	Standard deviation of return on assets (with a window width of 3 years).	ibid.	0.33	0.54	0.002	0.16	11.80
Beta	Measures the sensitivity of bank's stock return to market return. Beta is computed using a standard single index market model.	Bloomberg	1.02	1.63	-3.26	0.88	5.7

Table 2. Strength of agency conflicts and bank dividend payout ratios

Dividend payout ratios (DP)

	High	Low	Mean test: High-Low
ShareholderRights	26.17	29.69	-3.52*** (-6.14)
CreditorRights	35.35	27.89	7.46*** (8.22)

*Dividend payout ratio (DP) = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index. A country has a high/low level of shareholder rights if ShareholderRights is higher/lower than the sample median; a country has a high/low level of creditor rights if CreditorRights is higher/lower than the sample median. t-statistics are in brackets for null hypothesis of identical means are provided; ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, for a bilateral test.*

Table 3. Impact of agency costs of debt and equity on bank dividend policy.

Dependent: DP	HT	RE	FE
ShareholderRights	-4.10***	-3.88***	
	(-4.69)	(-3.46)	
CreditorRights	2.92***	3.67**	
	(2.79)	(2.55)	
HighCapString	4.92***	4.32*	4.75
	(4.16)	(1.77)	(1.66)
HighMarketFund/TF	1.41**	1.31*	1.40***
	(2.22)	(1.85)	(4.00)
Undercapitalized1	-4.10***	-4.30***	-4.04***
	(-5.33)	(-8.80)	(-11.89)
HighCompetition	4.33***	3.84***	4.32***
	(6.46)	(5.30)	(5.83)
HighCapitalDepth	7.70***	6.61***	
	(5.18)	(2.89)	
Tax	-0.06	0.05	-0.22
	(-0.67)	(0.40)	(-0.56)
Size	3.57***	1.97***	3.20
	(3.74)	(5.99)	(1.32)
ROA	2.14***	2.81***	2.10***
	(5.96)	(6.21)	(4.39)
AssetGrowth	-0.05***	-0.09***	-0.05**
	(-3.04)	(-5.11)	(-2.36)
LnZscore	1.63***	2.20***	1.60***
	(5.59)	(4.16)	(4.32)
Crisis	2.74**	2.05	2.59**
	(2.58)	(1.63)	(2.21)
Constant	-33.63***	-16.31*	-25.32
	(-3.03)	(-1.74)	(-0.54)
Year fixed effects	Yes	Yes	Yes
No. Obs.	7336	7336	7336
No. Banks	1148	1148	1148
R-squared within		0.11	0.11
R-squared overall		0.10	0.16
Hausman test FE vs HT; FE vs RE	9.06	247.35	
Chi-sq P-value	0.875	0.000	

This table reports Hausman-Taylor (HT), Random Effects (RE), and Fixed Effects (FE) regressions; Standard errors are clustered by bank. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; HighCapString = takes the value of one if the capital stringency index is higher than the sample median; HighMarketFund/TF = takes the value of one if long term market funding/total funding is higher than the country median; Undercapitalized1 = takes the value of one if total equity/total assets is lower than the country median; HighCompetition = takes the value of one if the country-level Lerner index is lower than the sample median; HighCapDepth = takes the value of one if market capitalization/GDP is greater than the sample median; Tax = highest individual income tax rates; Size = logarithm of total assets; ROA = Return on assets; AssetGrowth = Annual growth of total assets; LnZscore = logarithm of Z-score; Crisis = takes the value of one if there is a banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***.*

Table 4. Bank dividend policy, agency conflicts and bank-level characteristics (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: DP	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-4.15***	-3.35***	-7.17***	-1.57	-4.33***	-3.37***	-3.22***	-4.70
	(-3.86)	(-2.83)	(-5.04)	(-1.50)	(-4.15)	(-2.78)	(-3.29)	(-1.64)
CreditorRights	0.53	4.39***	3.13*	3.56***	3.92***	0.78	3.84***	4.79
	(0.40)	(3.46)	(1.89)	(2.91)	(3.18)	(0.55)	(3.60)	(1.40)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3428	3908	4763	2573	3700	3636	6254	296
No. Banks	806	837	872	692	859	815	1042	149
Hausman test FE vs HT	9.29	5.70	21.71	6.42	9.44	3.92	15.81	2.32
Chi-sq P-value	0.861	0.984	0.116	0.972	0.854	0.998	0.395	0.999

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table 5. Bank dividend policy, agency conflicts and legal rights enforcement (Hausman-Taylor estimator).

Dependent: DP	Rule of Law		Debt Enforcement	
	High	Low	High	Low
ShareholderRights	-7.25***	-5.71***	-4.55**	-10.89***
	(-3.42)	(-4.27)	(-2.33)	(-2.96)
CreditorRights	2.83*	-2.06	4.49**	-3.47
	(1.72)	(-1.04)	(2.50)	(-1.30)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
No. Obs.	5898	1438	5758	1177
No. Banks	900	265	866	222
Hausman test FE vs. HT	4.9	15.93	5.16	10.98
p-value	0.993	0.253	0.991	0.612

A country has high rule of law if its Rule of Law index (ROL) is greater than the sample median. A country has high debt enforcement if its debt enforcement efficiency index (DebtEnforcement) is higher than the sample median. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table 6. Bank dividend policy, agency conflicts and functioning of financial markets (Hausman-Taylor estimator).

Dependent: DP	Capital Depth		Capital Market Efficiency		Disclosure	
	High	Low	High	Low	High	Low
ShareholderRights	-9.53***	-5.51***	-5.31***	-1.24	-14.62***	-3.79**
	(-3.16)	(-3.27)	(-3.62)	(-0.62)	(-4.19)	(-2.46)
CreditorRights	4.13*	0.95	3.80***	0.45	7.91***	-1.60
	(1.94)	(0.46)	(3.13)	(0.27)	(4.09)	(-0.93)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	5552	1814	6332	425	5791	966
No. Banks	821	327	1019	109	848	186
Hausman test FE vs. HT	4.52	4.27	5.12	1.11	7.20	11.3
p-value	0.995	0.37	0.973	0.99	0.952	0.731

A country has high capital depth if its ratio of market capitalization to GDP (CapDepth) is higher than the sample median. A country has high capital market efficiency if the value of total shares traded to market capitalization (CapEfficiency) is higher than the sample median. A country has high disclosure requirements of its disclosure requirements index (Disclosure) is higher than the sample median. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table 7. Bank dividend policy, agency conflicts and bank competition (Hausman-Taylor estimator).

Dependent: DP	Competition1		Competition2	
	High	Low	High	Low
ShareholderRights	-2.89**	-3.91***	-3.18***	-4.21***
	(-2.25)	(-4.05)	(-3.69)	(-3.10)
CreditorRights	3.51***	1.70	2.72*	-2.05
	(2.87)	(1.37)	(1.95)	(-1.15)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
No. Obs.	3061	4275	6384	952
No. Banks	903	1005	1006	215
Hausman test FE vs. HT	8.3	13.19	8.52	5.45
p-value	0.911	0.588	0.901	0.987

A country has a high degree of competition in its banking system if its country-level Lerner index (Lerner) is lower than the sample median (Competition1). Alternatively, a country has a high degree of competition if its Herfindahl Index of bank market shares in terms of total assets (HHI) is lower than the sample median (Competition2). Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table 8. Bank dividend policy, agency conflicts and bank risk (Hausman-Taylor estimator).

Dependent: DP	Insolvency risk		Earnings volatility		Systematic risk	
	High	Low	High	Low	high	low
ShareholderRights	-3.46***	-5.59***	-3.14***	-6.4***	-6.49***	-9.81***
	(-3.88)	(-4.21)	(-2.99)	(-4.88)	(-5.29)	(-4.30)
CreditorRights	4.69***	2.10	3.04**	-0.31	2.81**	-1.61
	(3.21)	(1.62)	(2.43)	(-0.16)	(2.29)	(-0.57)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3671	3665	3498	3498	3498	3498
No. Banks	915	964	956	876	956	876
Hausman test FE vs. HT	4.4	12.08	9.24	2.63	9.24	2.63
p-value	0.996	0.673	0.865	0.99	0.865	0.99

A bank has a high level of risk if its insolvency risk (LnZscore) is lower than the country median, or if its standard deviation of ROA (SdROA) is higher than the country median, or if its systematic risk (Beta) is higher than the country median. Variable definitions. DP = Dividends to net income.; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

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Appendix A

Table A1. Distribution of banks by country and summary statistics for the period of 2001 – 2014.

Country Name	No. of Banks	Obs.	DP (%)	Shareholder Rights	Creditor Rights	CapString
Australia	10	71	66.79	4	3	10
Austria	7	49	17.21	2.5	3	5
Belgium	3	12	32.09	3	2	5.5
Canada	8	60	39.99	4	1	7
China	11	61	22.36	1	2	6
Croatia	4	16	48.50	2.5	3	9
Denmark	24	116	22.08	4	3	7
Ecuador	2	16	31.62	2	0	8
Egypt	7	27	39.93	3	2	9
El Salvador	3	12	21.32	2	3	6
France	22	109	19.09	3.5	0	9
Germany	6	21	24.01	3.5	3	8
Ghana	3	17	50.00	5	1	7
Hong Kong	5	46	38.04	5	4	7
India	34	264	20.09	5	2	10
Indonesia	17	89	30.09	4	2	10
Ireland	3	17	18.97	5	1	5
Israel	5	23	11.09	4	3	9
Italy	17	66	33.91	2	2	7
Jamaica	2	10	32.06	4	2	10
Japan	84	685	20.83	4.5	2	8
Jordan	6	32	42.15	1	1	10
Kazakhstan	7	25	3.63	4	2	9
Kenya	7	54	30.68	2	4	7
Lithuania	4	24	4.83	4	2	7
Malaysia	7	42	26.03	5	3	5
Morocco	5	20	44.01	2	1	9
Netherlands	4	13	41.68	2.5	3	9
Nigeria	9	38	47.01	4	4	5
Norway	18	92	22.59	3.5	2	8
Pakistan	7	28	30.60	4	1	9
Peru	3	25	45.00	3.5	0	9
Philippines	8	68	24.17	4	1	9
Poland	11	50	37.13	2	1	9
Portugal	3	24	36.68	2.5	1	8
Republic of Korea	10	52	22.19	4.5	3	7
Romania	3	19	36.36	5	1	9
Russian Federation	55	289	0.00	4	2	8
Singapore	7	45	39.07	5	3	8
Slovakia	2	13	61.25	3	2	7
South Africa	5	40	35.52	5	3	6
Spain	14	81	33.80	5	2	9

Sri Lanka	7	47	19.15	4	2	6
Sweden	2	22	42.90	3.5	1	4
Switzerland	11	61	42.30	3	1	8
Taiwan	13	37	37.67	3	2	8
Thailand	8	46	35.96	4	2	10
Turkey	11	60	13.18	3	2	11
Ukraine	4	23	0.00	3	2	9
United Kingdom	9	51	42.99	5	4	8
United States	611	4,128	28.23	3	1	9
Full sample median	7	42	32.06	4	2	8
Total	1148	7336				

DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; CapString = Capital stringency index (CapString). See Table 1 for definitions of variables.

Table A2. Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	*ShareholderRights*	1.00												
2	*CreditorRights*	0.50*	1.00											
3	*HighCapString*	-0.30*	-0.48*	1.00										
4	*HighMarketFund/TF*	-0.02	-0.02	0.02	1.00									
5	*Undercapitalized1*	-0.01	-0.01	0.01	0.07*	1.00								
6	*HighCompetition*	0.07*	0.04*	-0.04*	0.01	0.00	1.00							
7	*HighCapDepth*	-0.16*	-0.44*	0.21*	0.02	0.01	-0.16*	1.00						
8	*Size*	0.30*	0.34*	-0.26*	0.10*	0.07*	0.00	-0.14*	1.00					
9	*ROA*	0.02	0.11*	-0.03*	-0.00	-0.14*	-0.01	-0.25*	0.04*	1.00				
10	*AssetGrowth*	0.05*	0.11*	-0.02	-0.01	-0.06*	0.02*	-0.26*	-0.04*	0.22*	1.00			
11	*LnZscore*	-0.04*	-0.09*	0.05*	-0.04*	-0.11*	-0.09*	0.13*	-0.00	0.27*	0.02	1.00		
12	*Tax*	0.04*	0.07*	-0.14*	-0.01	-0.02	-0.18*	0.30*	0.28*	-0.22*	-0.25*	0.09*	1.00	
13	*Crisis*	-0.17*	-0.18*	0.20*	0.00	-0.02	0.42*	0.13*	-0.14*	-0.21*	-0.12*	-0.19*	-0.14*	1.00

*Variable definitions: ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; HighMarketFund/TF = takes the value of one if long term market funding/total funding (MarketFund/TF) is higher than the country median; HighCapString = takes the value of one if the capital stringency index (CapString) is higher than the sample median; Undercapitalized1 = takes the value of one if the value of equity/total assets (Equity/TA) is lower than the country median; HighCompetition = takes the value of one if the country-level Lerner Index (Lerner) is lower than the sample median; HighCapDepth = takes the value of one if the value of market capitalization/GDP (CapDepth) is higher than the sample median; Size = logarithm of total assets; ROA = Return on assets; AssetGrowth = Annual growth of total assets; LnZ Score = logarithm of Z-score; Tax = Highest personal income tax rate; Crisis = takes the value of one if there is a banking crisis. p<0.05**

Table A3. Robustness check with alternative dividend measure.

Dependent: Div/TA	HT
ShareholderRights	-0.051***
	(-3.06)
CreditorRights	0.06***
	(2.57)
HighMarketFund/TF	0.001
	(0.08)
Undercapitalized1	-0.03***
	(-3.87)
HighCompetition	0.02***
	(3.07)
HighCapitalDepth	0.09**
	(2.05)
Tax	-0.01***
	(-4.04)
Size	0.01
	(0.57)
ROA	0.07***
	(8.57)
AssetGrowth	-0.001***
	(-4.09)
LnZscore	0.01***
	(3.44)
Crisis	-0.01
	(-0.50)
Constant	0.10
	(0.62)
Year fixed effects	Yes
Controls	Yes
No. Obs.	7877
No. Banks	1154
Hausman test FE vs HT	10.66
Chi-sq P-value	0.639

HT = Hausman-Taylor estimator. Variable definitions: Dependent variable: Div/TA = Dividends to total assets; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; HighCapString = takes the value of one if the capital stringency index is higher than the sample median; HighMarketFund/TF = takes the value of one if long term market funding/total funding is higher than the country median; Undercapitalized1 = takes the value of one if total equity/total assets is lower than the country median; HighCompetition = takes the value of one if the country-level Lerner index is lower than the sample median; HighCapDepth = takes the value of one if market capitalization/GDP is greater than the sample median; Tax = highest individual income tax rates; Size = logarithm of total assets; ROA = Return on assets; AssetGrowth = Annual growth of total assets; LnZscore = logarithm of Z-score; Crisis = takes the value of one if there is a banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A4. Robustness check with alternative dividend measure (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: *Div/TA*	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-0.049**	-0.037*	-7.17***	-0.039*	-4.33***	-0.048**	-3.28***	-0.019
	(-2.54)	(-1.80)	(-5.04)	(-1.81)	(-4.15)	(-2.38)	(-3.36)	(-0.62)
CreditorRights	0.007	0.1***	3.14*	0.064**	3.92	0.014	3.74***	0.059
	(0.26)	(3.13)	(1.89)	(2.27)	(3.18)	(0.59)	(3.51)	(0.70)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3741	4110	5157	2694	3989	3862	6690	307
No. Banks	817	845	872	700	869	826	1046	156
Hausman test FE vs HT	7.49	8.20	21.71	10.62	20.16	7.11	15.65	4.35
Chi-sq P-value	0.943	0.915	0.116	0.779	0.166	0.954	0.406	0.996

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: Div/TA = Dividends to total assets; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A5. Robustness check excluding alternatively US, Japan and Russia (Hausman-Taylor estimator).

Dependent: DP	Panel A (without US)	Panel B (without Japan)	Panel C (without Russia)
ShareholderRights	-4.46***	-2.90**	-3.85***
	(-5.09)	(-3.04)	(-4.31)
CreditorRights	2.33**	3.25***	2.49**
	(2.32)	(3.18)	(-2.45)
Year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
No. Obs.	3208	6651	7047
No. Banks	537	1064	1093
Hausman test FE vs. HT	12.44	18.28	4.64
p-value	0.645	0.248	0.995

Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A6. Robustness check excluding US (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: DP	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-2.46**	-4.66***	-4.82***	-2.79**	-4.37***	-3.40***	-5.28***	-6.66*
	(-2.18)	(-4.16)	(-3.18)	(-2.05)	(-3.58)	(-2.48)	(-4.99)	(-1.76)
CreditorRights	0.95	3.29***	6.32**	3.26***	3.01**	1.01	2.44**	5.15
	(0.78)	(2.72)	(2.43)	(2.82)	(2.41)	(0.82)	(2.04)	(1.46)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	1439	1769	1153	2055	1642	1566	2196	226
No. Banks	384	413	277	411	402	384	431	109
Hausman test FE vs HT	9.06	9.43	7.21	6.26	15.61	7.18	21.44	1.69
Chi-sq P-value	0.874	0.854	0.926	0.951	0.409	0.952	0.123	0.99

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A7. Robustness check excluding Japan (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: DP	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-3.04**	-2.02	-7.17***	-0.49	-3.24***	-2.24	-3.22***	-4.70
	(-2.44)	(-1.55)	(-5.04)	(-0.42)	(-2.67)	(-1.64)	(-3.29)	(-1.64)
CreditorRights	0.38	5.16***	3.14*	2.75**	4.18***	1.05	3.84***	4.79
	(0.29)	(4.03)	(1.89)	(2.29)	(3.43)	(0.76)	(3.60)	(1.40)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3116	3535	4763	1888	3326	3325	6254	296
No. Banks	734	768	872	608	796	756	1042	149
Hausman test FE vs HT	6.71	17.53	21.71	14.29	21.38	3.53	15.81	2.32
Chi-sq P-value	0.965	0.288	0.116	0.503	0.125	0.998	0.395	0.99

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A8. Robustness check excluding Russia (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: DP	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-3.61***	-3.22***	-7.03***	-0.1	-3.56***	-3.46***	-2.89***	-4.79*
	(-3.25)	(-2.79)	(-5.01)	(-0.10)	(-3.41)	(-2.27)	(-3.08)	(-1.70)
CreditorRights	0.66	3.87***	3.42**	2.63**	3.68***	0.02	3.29***	5.71*
	(0.51)	(3.19)	(2.01)	(2.42)	(3.14)	(0.01)	(3.25)	(1.67)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3275	3535	4719	2328	3551	3496	5983	278
No. Banks	763	768	857	638	815	775	987	141
Hausman test FE vs HT	4.63	4.11	19.25	11.67	8.97	5.79	11.91	2.06
Chi-sq P-value	0.995	0.997	0.203	0.708	0.879	0.983	0.686	0.99

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A9. Robustness check excluding cooperative and savings banks (Hausman-Taylor estimator).

Dependent: DP	Without Cooperative and Savings banks
ShareholderRights	-3.44***
	(-4.61)
CreditorRights	3.08***
	(3.13)
HighMarketFund/TF	1.51***
	(2.28)
Undercapitalized1	-4.22***
	(-5.28)
HighCompetition	4.12***
	(5.75)
HighCapitalDepth	8.12***
	(5.23)
Tax	-0.12
	(-1.29)
Size	8.66***
	(4.88)
ROA	2.08***
	(5.7)
AssetGrowth	-0.06***
	(-3.350)
LnZscore	1.67***
	(5.63)
Crisis	2.90***
	(2.64)
Constant	22.24***
	(4.59)
Year fixed effects	Yes
Controls	Yes
No. Obs.	6989
No. Banks	1089
Hausman test FE vs HT	9.38
Chi-sq P-value	0.857

Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; HighCapString = takes the value of one if the capital stringency index is higher than the sample median; HighMarketFund/TF = takes the value of one if long term market funding/total funding is higher than the country median; Undercapitalized1 = takes the value of one if total equity/total assets is lower than the country median; HighCompetition = takes the value of one if the country-level Lerner index is lower than the sample median; HighCapDepth = takes the value of one if market capitalization/GDP is greater than the sample median; Tax = highest individual income tax rates; Size = logarithm of total assets; ROA = Return on assets; AssetGrowth = Annual growth of total assets; LnZscore = logarithm of Z-score; Crisis = takes the value of one if there is a banking crisis. t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Table A10. Robustness check excluding cooperative and savings banks (Hausman-Taylor estimator).

	Market Funding		Capital Stringency		Capitalization		TCR	
Dependent: DP	High	Low	High	Low	High	Low	High	Low
ShareholderRights	-4.28***	-2.19**	-5.81***	-1.69	-4.32***	-3.35**	-3.41***	-3.35
	(-3.78)	(-2.67)	(-4.08)	(-1.50)	(-3.17)	(-2.58)	(-3.34)	(-1.22)
CreditorRights	-0.27	4.17***	4.62*	3.49***	3.73***	0.21	3.58***	3.93
	(-0.19)	(2.86)	(1.82)	(2.62)	(2.70)	(0.13)	(2.90)	(1.14)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3261	3908	4590	2399	3501	3488	5937	276
No. Banks	765	837	837	641	810	773	985	140
Hausman test FE vs HT	6.5	6.05	20.33	7.86	9.25	3.71	18.2	2.5
Chi-sq P-value	0.97	0.979	0.159	0.929	0.864	0.998	0.252	0.99

A bank has a high level of market funding if its long term funding to total funding ratio (MarketFund/TF) is higher than the country median. A country has high capital stringency if its capital stringency index (CapString) is higher than the sample median. A bank has a high level of capitalization when its equity to total assets ratio (Equity/TA) is higher than the country median. A bank has a low total regulatory capital ratio (TCR) when its TCR is lower than the country regulatory threshold plus two percent. Variable definitions: DP = Dividends to net income; ShareholderRights = Revised anti director index; CreditorRights = Creditor Rights Index; t-statistics are in parentheses, with p<0.1, p<0.05** and p<0.01***. Standard errors are clustered by bank.*

Appendix B

We follow Love and Peria (2015) to estimate the Lerner index. We first estimate marginal cost by using the translog cost function; we then compute the Lerner index as the difference between price and marginal cost relative to price:

$$lnTC_{i,t} = \alpha_0 + \alpha_1 lnTA_{i,t} + \frac{1}{2}\alpha_2 (lnTA)^2_{i;t} + \sum_{j=1}^{3} \beta_j \, lnw_{j\,i,t} + \sum_{j=1}^{3}\sum_{k=1}^{3} \beta_{jk} \, ln\, w_{j\,i,t} lnw_{k\,i,t}$$

$$+ \sum_{j=1}^{3} \gamma_j \, lnTA_{i,t} lnw_{j\,i,t} + \gamma_t + \varepsilon_{i,t} \qquad (i)$$

$$MC_{i,t} = \frac{TC_{i,t}}{TA_{i,t}} \left(\alpha_1 + \alpha_2 lnTA_{i,t} + \sum_{j=1}^{3} \gamma_j lnw_{j\,i,t} \right) \qquad (ii)$$

$$Lerner_{i,t} = \frac{Price_{i,t} - MC_{i,t}}{Price_{i,t}} \qquad (iii)$$

Where subscript *i* and *t* denote bank i and time t; *lnTC* is the logarithm of total cost; *lnTA* is the logarithm of total assets; *lnw* is the logarithm of input cost, where inputs are: $w_{1,}$ the ratio of interest expenses to total deposits; $w_{2,}$ the ratio of personnel expenses to total assets; and $w_{3,}$ the ratio of other operating and administrative expenses to total assets. *MC* is marginal cost, and *Price* is bank's revenues (interest income and non-interest income). Equation *(i)* is estimated for each country using fixed effects; we then compute a country's Lerner index for each year *t* by averaging the Lerner indices of banks from Equation *(iii)* for year *t*.

Highlights:

- Analyze bank dividends relative to agency conflicts of shareholders & creditors.
- Bank dividends influenced more by agency cost of equity than the one of debt.
- Investigate impact of funding structure, capitalization and capital stringency.
- Also examine role of differences in external corporate governance mechanisms.